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Brief Report

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A “New” Way of Organizing the EMR

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Introduction

It is clear that although the Electronic Medical Record (EMR) has had a positive impact upon healthcare delivery, it is still a work in progress. Based upon a consideration of currently identified problems and issues with the current system, it is proposed by this article that there be three areas of reorganization: Firstly, data should be pushed out to providers to improve speed and accuracy of communication. Secondly, patients should be able to input data into their own medical records. Thirdly, there should be a universal EMR or the adoption of a standardized data storage system to eliminate problems associated with the use of lack of communication between different versions of the EMR. Historically physicians and hospitals documented the care they provided using pen and paper. Although there are some advantages (perceived and real) to this method of archiving data, there were some notable disadvantages as well. Notorious for their bad penmanship, physicians often wrote orders that were difficult to decipher. This regularly caused nurses and unit secretaries to guess at what was written and patients were at risk for harm from misinterpreted orders. In addition to issues with legibility, paper records were difficult to store because they took up a large amount of space and since there was no back up to the documentation, if they became lost the patient’s information was gone forever.

Another difficulty with use of the paper chart was the struggle finding pertinent information. If a physician had a question he or she would have to read through sometimes volumes of information trying to pull out the needed data, a time consuming process. Papers often fell out, altering the chart’s organization and it was not uncommon for patients to be sent back for lab work or other testing because the results could not be found in the chart. Additionally, billing using a Last in First out (LIFO) organized paper chart was often inaccurate due missing information, due to the brevity of the clinician’s note or secondary to coder misinterpretation of poor handwriting.

Widely used today, the Problem Oriented Medical Record (POMR) as developed by Weed uses a problem-solving model to document patient information. When using this method the provider collects subjective and objective data prior to identifying patient problems. Once the data is collected a problem list is developed. Finally, a plan of care is established based on the problem list using a SOAP note format (Subjective, Objective, Assessment, Plan). The SOAP format is used to document progress until discharge when a discharge summary is completed [1]. Weed’s method has been criticized for removing the art from medical practice and for essentially dehumanizing people by reducing them to a list of their problems. Today with the EMR this is an even greater issue because the provider inputs data that is stored by the EMR as a series of loosely connected problems and plans. Not only is the patient dehumanized but it has become increasingly difficult to tell from the record if the patient is improving or not [2]. Also according to Wachter [2] the act of writing the SOAP note by hand in some way helped keep the physician in touch with the patient as an individual in a way that inputting data into the EMR cannot do. The loss of subjective understanding of a patient’s problems is a significant concern as we change from paper to electronic documentation methods.

As the public health division of the United Nations, the World Health Organization is tasked with providing leadership on health systems and public health issues throughout the world. According to their publication, Components of a Strong Health Information System [3], they have identified what they believe to be the six most important components of a good health information system framework. They divided their framework into three classifications: Inputs, processes and outputs. The inputs identified by WHO included the resources needed to initiate and manage a health information system including: leaders with the skill to lead and synchronize processes, the enactment of supportive laws and policies, the provision of needed financing, and individuals who possess the skills needed to do the necessary work. Also included was the infrastructure, described as offices, furniture and computer systems. Processes were defined as indicators or metrics that can be used to determine if there have been improvements in the health of the country. Data sources (the ability to compile the data from multiple sources) and data management (the ability to provide easy access to authorized persons while protecting privacy) were also listed as an important process. Outputs were described as needing to be “Relevant, accessible and useful for decision making” (para. 9). WHO believes information products must come from a variety of sources and be put together for statistical analysis and comparison. Finally, information must be distributed widely and must provide a benefit for participating individuals so as to encourage the strengthening of the system.

The discipline of medical informatics has developed many goals for the improvement of healthcare, among them is the goal to provide patients with better continuity of care. In this day and age of fragmented care, the need for technology to link providers together is becoming more significant. In most areas, hospitalized patients are no longer cared for by their primary provider; instead acute care is provided by hospitalists who do not know the person’s history and who will only provide care during their scheduled shift. Some acute care patients have upwards of 3 attending physicians during one hospital stay, making it imperative that important patient specific data be easy for current providers to access. Once discharged, patients return to their primary provider who has received a brief discharge summary, authored by only one of the hospitalists, and likely to be lacking some pertinent information. When factoring in any specialist involvement, it is easy to see how information can become lost, leading to the potential of poor patient outcomes. This disconnect between providers has made it increasingly evident that information networks must be developed to link the healthcare record into one database, accessible by all providers. This network should also allow the patient to input data since the individual is the true expert in his own medical condition and the most interested party in the success of any treatment plan. This goal would be best met via a universal EMR, accessible to all providers.

In keeping with the above recommendation, an important goal of informatics, according to Shortliffe [4], is to develop an information management infrastructure that will help providers educate patients on health promotion activities. One way that the EMR could accomplish this would be to enable patients who suffer from chronic illness to input data into their own medical record for review by the physician prior to a scheduled appointment. This would save time during the visit because the records would already be reviewed and the plan of care would already be devised. For example, a patient with type 2 diabetes would upload glucometer records to EMR on a daily basis. The EMR would push out critical high or low glucose levels to the practitioner, alerting him or her that the patient had an issue, enabling rapid medical intervention if needed. Levels that fell within a determined range (ostensibly 70-120) would not be pushed out but would be available for the provider to pull before the patient’s appointment. This would improve provider satisfaction because time could be set aside each day for a focused review of patient records. It is also likely to increase patient satisfaction because there would be more time for education and interaction during the visit since the provider would be prepared to meet with the patient. This method could also be used for lifestyle change education for patients with lifestyle diseases. Patients could be issued an electronic activity monitor that would collect data (e.g. steps walked per day, calories consumed) that the patient could upload to the providers data base for review prior to a follow up appointment.

Recommended Reorganization of EMR

In keeping with the objectives of informatics to improve patient safety, The Joint Commission (TJC) was founded in 1951 with the goal of “Evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value” [5]. In keeping with their vision which is stated as “All people always experience the safest, highest quality, best-value health care across all settings” [5] they establish each year National Patient Safety Goals (NPSG) which the 20,500 facilities they certify are expected to meet [6]. The goals established for the year 2015 include many elements possible to be addressed by changes in how the EMR communicates. Although not all of the NPSG can be addressed by reorganizing the way the EMR handles patient data, NPSG 1 (to improve the accuracy of patient identification) has been reasonably well addressed via the use of bar code scanning. The ability to scan a bar code on a patient’s name band for identification helps nurses ensure that they are consistently providing caring for the correct patient. NPSG 2, “Improve the effectiveness of communication among caregivers” [7], has not yet been adequately addressed by current EMR systems. Specific to this goal is the timely reporting of critical lab values or the results of diagnostic testing. Because nurses are often very busy they don’t always look for lab results right away, leading to missed abnormal values. If they do notice that a lab is off they don’t always call the provider because there are a multitude of gray areas regarding this issue. Nurses, especially those who work at night, are often hesitant to call a physician to report abnormal values partly because questions arise as to what values are important to report and which are not as important even if the lab denotes them as “Critical” (e.g. potassium levels versus phosphorous levels) and partly because they don’t think the physician wants to know the information if he or she is sleeping. This leads to critical values often not being reported in a timely manner which can result in poor patient outcomes.

A solution to this problem would be to reorganize the EMR infrastructure and add the ability push the data out to the mobile devices controlled by healthcare providers. Currently most EMR systems require providers to pull the data out, meaning that the information is available but the individual has to enter the record and look for the result. If the nurse or doctor is busy or distracted this does not always happen in an expedient manner. The EMR system could be reorganized to provide important information via an encrypted text message or an encrypted email. Because privacy is of great concern if it cannot be guaranteed that the server is secure, the provider could receive a message prompting him or her to check the patient’s chart without specific mention of the critical value or abnormal test results. Organizing the EMR in such a way as to push important data out to providers would help improve communication at all levels of care. This method could also be used to alert nurses when patients have abnormal vital signs or to alert nurses that new orders have been added through the Computer Provider Order Entry system (CPOE). The latter would be a satisfier for nurses who often are unaware of new orders that they need to initiate because with CPOE physicians can order care from remote locations. Removing the “Middle man” in all of these interactions would help ensure consistent and clear communication with regard to a change in a patient’s condition.

Finally, the EMR should be reorganized so that when a provider opens a patient’s health record, a summary view comes up, including only the most pertinent data, with live links to more complete data on each issue noted on the summary. This would allow the provider to quickly drill down, understanding the big picture and rapidly assessing significant problems in order to determine best treatment.

So, the big question is who should be responsible for the organization of the EMR of the future. As difficult as it is to say since the United States Government is not good at keeping expenses down or simplifying processes, it seems clear that the federal government must be in charge of organizing the EMR. As addressed by Shortliffe [4] there is a significant need for better standards associated with the EMR due to the multitude of available systems, many of which do not interface with one another. The lack of a standardized EMR makes it oftentimes impossible for patients to receive congruent care. An example of the need for standardization of the EMR can be found within Adventist Health, a corporation overseeing acute care facilities, home care and hospice agencies, Hospital based outpatient clinics (HBOC) and community care clinics. Currently, each entity within the corporation is using a different EMR, purchased from a different vendor; none of which interface with Cerner, the inpatient EMR system. This means when a current clinic or HBOC patient comes in to the emergency department (ED) or is admitted the ED physician and hospitalist cannot review past labs (even if they were taken on the day of care), health history or have access to any other pertinent information. This translates to a loss of patient satisfaction because patients often object to having labs redrawn and could lead to poor outcomes secondary to excessive radiation exposure if X-Rays or CT scans are repeated frequently. In addition, it wastes the provider’s time, gathering data from the patient that should have been available for review in the existing medical record. Nursing time is wasted and accuracy is compromised when nurses are forced to enter the patient’s medication list manually during each visit to the hospital because the list kept by the prescribing provider is not available. Fundamentally, this incongruence leads dissatisfaction and to a significant loss of time and money for the patient and the facility.

In lieu of overt government control over the EMR, another approach would be to legislate universal adoption of the International Organization for Standardization (ISO) standard ISO 10781 Electronic Health Record-System, Functional Model, release 1.1 [8]. Adopting a standard such as ISO 10781 which has been accepted by the ISO would ensure that every software company use the same standard for storing EMR data and therefore every EMR system would be able to communicate with each of the others. Because the ISO is a non-governmental organization operating in 163 countries with 3,358 technical partners, it has the ability to provide for standardization and exchange of information on an international level, enhancing continuity of care globally [9].

Because we are a capitalistic society any attempt to use a private company to provide a universal EMR system would be a violation of the Sherman Antitrust Act, a law passed in 1890 to protect industry from the development of monopolies [10]. The government is the only entity with the legitimate right to develop a universal EMR system. They are also the only entity with the power to enforce the use of said system and therefore a universal system will only exist if mandated by them. Appointing two or three corporations to develop competing systems in order to provide choice for healthcare agencies is likely to be less successful since the issues related to interfacing may still exist because competitors may not work well with each other. Advantages to using private industry would be greater efficiency than is usually found with government programs and a lower cost for purchase since competition frequently drives cost down. Currently many of the EMR are based on reimbursement, making back end interpretation easier and front end patient data entry cumbersome. It would behoove the developers of any universal EMR to include clinicians in the development of the new product, trialing it in a clinical setting so that the record that is generated is clear, concise and accurate while maintaining ease of interpretation for coders and billers. Consulting with providers as to their needs would enable computer programmers to gain insight into the needs of their customers. The aforementioned inclusion of a computer generated summary page for clinicians to view is one way that the EMR could improve provider user satisfaction.

Conclusion

It is clear that by further developing the usability of the EMR there is the potential to improve patient care and provide patients with better outcomes. The United States spends more dollars per capita on healthcare than any other nation, however our morbidity and mortality rates do not reflect this rate of expenditure. The development of national standards, improved communication, greater ease of access to data, the ability of patients to input data into their personal records, and the development of a universal EMR are some ways to improve the providers' ability to provide evidence based and individualized care for their patients. These improvements are therefore likely to translate to better patient outcomes. This is an exciting time for healthcare and technology because the possibilities for what they can do together are endless!

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